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AUTHOR Richards, Beverly
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ABSTRACT

The Flex Lab at Santa Fe Community College, in New Mexico, is a self-paced, computer-assisted training center that allows students to accommodate college credit courses into their schedules. The Lab offers courses in introductory computers, keyboarding, and various computer programs and emphasizes several features of the Personalized System of Instruction (PSI) developed by Fred Keller. The aspects of the Lab curriculum which reflect the PSI include the following: (1) discrete modules, reflected in the six sequential modules of the one-credit Business and Office Technology course; (2) an emphasis on individual study, reflected in the self-paced, independent nature of the curriculum; (3) the use of supplementary instruction, provided by group orientations to the lab at the start of each semester; (4) the use of unit exams, which is very important in the Flex Lab environment of decreased instructor-student interaction; (5) the use of proctors, who are available for most of the hours that the Lab is open to answer questions; (6) self-pacing, which helps expedite the completion of prerequisites, learn at a more flexible rate than in a traditional classroom setting, and negotiate work and family obligations; and (7) mastery, encouraged by instructors who return assignments for revision before final grading. Evaluative research of the PSI method indicate that students achieve better scores, retain information longer, and show more interest than traditional students. (ECC)

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FRED KELLER AND THE FLEX LAB

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by

Beverly Richards

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Beverly Richards
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FRED KELLER AND THE FLEX LAB

The young man's gait slowed as he approached the open door. Cautiously his eyes read the sign and glanced through the opening. Stepping inside he looked around, wrinkled his brow, and looked perplexed.

"Can I help you?" I asked.

"Well, I, no, I guess not. I mean, I thought this was a ... I don't see any exercise mats or anything. What exactly is the Flex Lab?"

Santa Fe Community College's Flex Lab is providing a series of new opportunities to students throughout Northern New Mexico. It is not, however, in competition with the Physical Fitness Center. Flexibility in scheduling is the source of the name, and we're finding that it meets the needs of a world of students that were otherwise excluded from our college offerings. Ormrod (1990) describes Fred Keller's principal that "all students can master the same material when given adequate study time and assistance" (p. 83). Based on that theory, this self-paced computer-assisted training center is designed to make college credit courses fit the schedules of our students in a supportive environment.

This computer lab consists of 20 IBM computers and offers courses in Introductory Computers, Keyboarding, WordPerfect, dBase, Lotus, DOS, and Desktop Publishing. All courses use texts, computer programs, and student guides. The Lab is staffed by college instructors and instructor assistants during the 53 hours it is open each week. Instructors and assistants are available to work

with students on a one-to-one basis or in small groups (Halsey, 1994). Enrollment for the Spring Semester is open until March 31, and course work must all be finished by May 6. We opened our doors in January with 99 students enrolled and are very close to 140 students as of February 28.

I was given the opportunity to coordinate the opening of the Flex Lab before I read about Fred Keller's work and the Personalized System of Instruction (PSI). I am responsible for curriculum development, course materials, staffing decisions, and general operations of the Lab. It was quite a relief to find that we had stumbled onto the majority of the features Fred Keller describes as important to success. Jeanne Ormrod describes seven main features of PSI in Human Learning (1990) which are described below as they apply to the creation of SFCC's latest endeavor in self-paced training.

1. **Discrete Modules.** In preparing our course outlines, or student guides to the course work, we broke our one credit Business and Office Technology courses down into six modules. Each one covers a specific topic with reading assignments, hands-on applications, written quizzes, and notes from the instructor. Students must complete one module before they are ready to begin the next.
2. **Emphasis on Individual Study.** The Flex Lab is designed to be a place where students will work independently. In fact, we find that many of our students do their assignments at home or at work. Our staff is available to assist students and answer questions, and most of the time we find this works fairly well. On occasion, we have students come in who expect the instructor to sit beside them for the duration

of their stay. This has been a delicate situation in balancing a supportive environment with a reasonable amount of assistance. It is interesting to observe that students who request a lot of help usually seem to need moral support more than they do actual information.

3. **Supplementary instruction techniques**. We do provide group orientations to the Flex Lab at the beginning of the semester. We are not currently offering any other type of traditional group instruction at this time. However, we have recently seen a trend in our Introduction to Computer students that reflects a lack of ability to complete a beginning module on the DOS operating system. As we have nearly 40 students enrolled in that class, we are considering group question and answer sessions on a weekly basis to help minimize the extensive one-on-one assistance required on this particular chapter.

4. **Unit Exams**. Each module ends with a series of assignments that need to be turned in. Some course material lends itself to a module or unit exam. As I have observed the use of the different course outlines (all written by different instructors), I realized that we need more applications which truly test the student's knowledge of the concepts taught in that module. Where the concept of testing may be important in traditional classes as well, it appears more vital in self-paced instruction due to the limited interaction a teacher has with her students. A furrowed brow and vacant stare often alert the classroom instructor to a lack of understanding, even if the correct

answer has been given. With self-paced instruction, careful testing plays an essential role in determining mastery of the subject.

5. **Use of proctors.** We currently have a high percentage of instructor-staffed hours in our Flex Lab. Supplementing instructor hours, we have knowledgeable assistants to work with the students. The feedback on the proctors has been excellent. It is, however, essential that entire staff is cross-trained on all subjects we offer. In order to achieve this, we must continually allow time and effort for cross training. This also is a concern as we strive toward expanding the course offerings of the Flex Lab. At this point, we are working on offering more advanced classes in the existing software packages, rather than introducing new topics to the curriculum.

6. **Self-pacing.** This is one of the strongest drawing cards the Flex Lab offers. We have students who need to complete a course as a prerequisite or for work who are delighted with their ability to complete the course work in a few days (requiring intense study, but possible). Others come to us as transfer students from traditional classes that they felt were going to quickly or too slowly. The additional benefit of being able to set their own schedule allows them to work around child care issues, work schedules, family obligations, vacations, illness, and changes in their school schedules.

7. **Mastery.** Ormrod (1990) defines "mastery" as "passing a module exam at a certain criterion, such as eighty percent to ninety percent correct responses. When a student's exam performance does not

meet the criterion....the student must return again to take another exam on the same material before proceeding further in the course" (p. 83). Since some of our classes are graded on a pass/fail basis, we find this type of mastery is essential to success. Teachers often return work for further adjustments and corrections before accepting it as a final assignment. By working this way, each student succeeds in the class and is encouraged by his or her ability to meet the requirements. The dropout rate for students appears to be very low. I believe this is tied to their "engineered" success by allowing them as much time and opportunity as needed.

One of the primary changes that I believe we will make in the future is to implement a stronger requirement for competency-based evaluation. This, along with a formal structure for the class, has been deemed a key element in the success of PSI (Gray, 1989). I was recently assisting a student who was taking a traditional course which I have taught in the past. I was astonished at the level of competency required for her to complete her homework. I realized how effective her teacher's methods were. They demanded a true understanding of the concepts as opposed to exercises that walked the student through the process. I also realized the value of assigning competency-based homework which required a student to work independently, rather than having all practice work done in class. By implementing the Keller Plan (PSI), which is designed to achieve "high efficiency" in learning, it is reasonable to expect a high level of skill as students master the topics (Naumes, 1977).

As we look forward to increased enrollment and an opportunity to measure the success of our students, I am encouraged that two extensive evaluations of PSI have indicated that PSI students achieve better scores, retain the information longer, and show more of an interest in further courses than students in traditional classes (McGaw, 1975). A study done at Cuyahoga Community College in Ohio reflects the same type of success. PSI students do well and often better than students in traditional classes (Taber, 1974). Further support comes from a meta-analysis done in 1979 which used 75 comparative studies of Fred Keller's PSI and showed achievement is far above average with less difference between students in college classes (Kulik, 1979).

Not everyone sees PSI as a gold-star solution. In a paper presented at the Annual Meeting of the Rocky Mountain Psychological Association, Fred Keller's PSI was criticized on the basis that there were no solid methods for evaluating it (Powers, 1972). However, this paper was presented in 1972, only 8 years after the introduction of the theory. More recent research seems to be accepted by the educational community, and it supports the overall success of the process.

Although no method of teaching is without its faults, I am impressed and delighted with the progress we are seeing in our Flex Lab at Santa Fe Community College. Although a variety of problems may arise, it is hard to imagine difficulties which would overrule the increase in opportunity for students we would otherwise be unable to serve. As we continue to expand our offerings and evaluate our students' progress we will form our own opinion of its effectiveness. Who knows? We may even expand to compete with the Fitness Center!

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